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09/508,847	06/19/2000	MARKUS R MULLER	C-36404	5211

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EXAMINER	
AKHAVANNIK, HUSSEIN	
ART UNIT	**PAPER NUMBER**
2621	10

DATE MAILED: 09/24/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/508,847	MULLER, MARKUS R	
	Examiner	Art Unit	
	Hussein Akhavannik	2621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-20 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-20 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 09 July 2003 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Response to Amendment

1. The amendments to claims 1 and 4 overcome the Examiner's objections cited in paragraph 1 of the previous office action.

2. The amendments to the specification overcome the Examiner's objections cited in paragraph 2 of the previous office action.

3. The drawings filed July 9, 2003 overcome the Examiner's objection cited in paragraph 3 of the previous office action.

4. The amendments to claims 1 and 8 overcome the Examiner's 35 U.S.C. 112 rejections cited in paragraph 6 of the previous office action.

Response to Arguments

5. The Applicant alleges that Olsson does not teach or suggest the feature of not adjusting the camera settings. The Examiner agrees that the system of Olsson is directed towards multiple shots taken at different camera settings, as explained on page 2, lines 4-6. However, adjusting the spatial settings of a camera (the camera location) instead of changing the camera settings in order to maintain focus on a moving object is well-known in the art. Fullam et al (U.S. Patent No. 5,666,569) explain in column 1, lines 13-62 that the spatial setting of a camera is adjusted in a single lens camera in order to determine the proper focal distance of the camera. Fullam et al explain that a single lens camera cannot be adjusted and therefore, the spatial settings of the camera must be adjusted to achieve a proper focal distance. This embodiment provided by Fullam et al is an equivalent method of focal length adjustment to the embodiment of Olsson, wherein the camera settings are adjusted to determine the optimal focal length to image an

object. In both embodiments the camera maintains a constant focal length with respect to the object. Furthermore, by not adjusting the camera settings as explained by Fullam et al, the magnification of the object will not change and the images do not have to be corrected for scale before assembly. Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to adjust the spatial settings of a camera and not adjust the camera settings in Olsson's increasing depth of field system as these two methods (adjust spatial setting vs. adjust camera settings) were art-recognized equivalents at the time of the invention.

The applicant alleges that Olsson does not teach or suggest moving the camera relative to the object. The Examiner agrees that Olsson does not explain moving the camera relative to the object. However, Fullam et al explain that the image pickup device (camera) may be moved (camera is positioned) in order to obtain a proper focal length position of the camera in column 1, lines 59-62. It would be advantageous to maintain the same focus between images being combined, such as in the image assembly systems of Olsson, so that the images in a sequence have the same properties (magnification, intensity, warping, S/N, etc.). However, when an object moves, the object may go out of focus and it would then be necessary to move the camera, so that the distance between the camera and object is fixed ("that distance from the object") and the object remains in focus. Furthermore, Dani et al explain that if the images of a sequence to be assembled are taken at different relative distances, then the magnification factors and the warping factors would have to be corrected before assembling on page 432, first column. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to maintain a fixed relative distance between the camera and the object so that the processing time and power to assemble the images is reduced.

The Applicant alleges that the location of the subject in Mimura et al does not change, but that the camera settings change. The Examiner agrees that that the camera settings of Mimura et al change when the image pickup device is moved. However, Fullam et al do explain changing the spatial settings of a camera in order to obtain a proper focal corresponding to the start of paragraph 5, above.

Specification

6. The disclosure is objected to because of the following informalities:

On page 2 of the specification, "Brief Description of the Invention" should be changed to "Detailed Description of the Invention".

Appropriate correction is required.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 1-2, 8-12, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Olsson (WO 97/25690) in view of Fullam et al (U.S. Patent No. 5,666,569).

Referring to claim 1,

i. Making a plurality of individual recordings of the object with a single camera at various spatial settings with respect to the relative position between the object and the camera without adjusting camera settings in not explicitly explained by Olsson. Olsson does explain shooting multiple images of an object

with a single camera at different camera settings on page 3, paragraph 2. However, Fullam et al do explain that it is necessary to know the exact distance between a camera's aperture and a target in order to take a sharp image of a target using a single lens camera (no camera adjustments) in column 1, lines 13-25. Furthermore, Fullam et al explain it is required that a user position a camera at a certain distance from an object in order to achieve proper focal length in column 1, lines 59-62. This embodiment provided by Fullam et al is an equivalent method of focal length adjustment to the embodiment of Olsson, wherein the camera settings are adjusted to determine the optimal focal length to image an object. In both embodiments the camera maintains a constant focal length with respect to the object. Furthermore, by not adjusting the camera settings as explained by Fullam et al, the magnification of the object will not change and the images do not have to be corrected for scale before assembly. Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to adjust the spatial settings of a camera and not adjust the camera settings in Olsson's increasing depth of field system as these two methods (adjust spatial setting vs. adjust camera settings) were art-recognized equivalents at the time of the invention.

ii. Determining the sharply imaged areas of the individuals is explained by Olsson on page 3, paragraphs 4-6. Olsson explains that the focused image element is selected from each of the captured images.

iii. Assembling the sharply imaged areas of all the individual recordings to form at least one resulting image is explained by Olsson on page 3, paragraph 3. Olsson explains that a sharp image is created by adding together focused different image elements.

Referring to claim 2,

i. Storing the individual recordings in a computer is explained by Olsson on page 9, paragraph 3.

ii. The sharply imaged areas of the individual recording being determined by the computer with the aid of digital methods is explained by Olsson on page 9, paragraph 5. Olsson explains that programs can be added to the computer to select elements from different images, which are the basis of subsequent corrections.

iii. The resulting images being assembled with the aid of a computer is explained by Olsson on page 9, paragraph 5. Olsen explains that programs can be added to the computer for matching the basic image format for integration of focused image elements.

Referring to claim 8, the individual recordings being made at fixed, predetermined relative distances between the camera and the object is not explicitly explained by Olsson. However, Fullam et al explain that a user has to position a single lens camera a certain distance from a target in order to achieve proper focal length to capture a sharp image of the target in column 1, lines 59-62. If the object were to move, then the user would reposition the camera in order to maintain the proper focal length as the single lens camera cannot be adjusted.

Maintaining a fixed, predetermined distance between a target and the camera would have been obvious to one of ordinary skill in the art at the time the invention was made in order to preserve the proper focal length of a non-adjustable camera when the target moves.

Referring to claim 9, a CCD camera being used as the camera for recording the sequence of individual recordings is not explicitly explained by Olsson. However, Fullam et al explain using a CCD to capture images in column 2, lines 2-12. Using a CCD camera would improve the system of Olsson by saving the time and computation required to convert analog images to digital images. It would also allow the system of Olsson to work in real time. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a CCD camera for recording a sequence of images.

Referring to claim 10,

i. Storing all the individual recordings of the sequence in a computer is explained by Olsson on page 9, paragraph 3. Olsson explains that the software on the computer can store several images, which together would constitute a sequence.

ii. Determining the sharply imaged areas after recording of the individual recordings has been concluded is explained by Olsson on page 9, paragraph 5. The computer programs can process the images to be able to select elements after the images have been stored on the computer.

Referring to claim 11, the sharply imaged areas of each individual recordings being identified and incorporated into the resulting image immediately after the individual recordings have been made is explained by Olsson on page 9, paragraph 5. The computer programs

processes each image stored on the computer individually, either after all the images are stored or after the sequence of images is collected. Such processing is available because Olsson does not require information from an entire sequence of images to determine the in-focus region of a single image.

Referring to claim 12, a plurality of resulting images being assembled from the individual recordings, different areas of the object or different features of the object being shown in the resulting images would be inherent in the system of Olsson. The system of Olsson is capable of assembling a plurality of images to produce a resulting image. Using different portions from the sequence of images, multiple resulting images can be produced that would each include different features of the object being imaged.

Referring to claim 20, a computer, a camera, and a control device being provided is explained by Olsson on page 9, paragraph 2. Olsson explains that a camera is connected to a computer for obtaining images of an object. Olsson further explains that the camera consists of controls, whose settings can be registered.

9. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Olsson in view of Fullam et al, and further in view of Duvent (U.S. Patent No. 4,701,782).

Referring to claim 3, the sharply images areas being determined by digital formation of the derivative is not explicitly explained by Olsson or Fullam et al. However, Duvent does explain determining the focus of a camera by taking the derivative of the input image in the abstract and in column 3, line 30 to column 4, line 5. Duvent explains that the quality parameter determines whether the image is appropriately in focus. When an image is in focus, the contours of the image are very sharp and therefore, the contours would have high derivative values. It

would be obvious to insert the digital derivative computing method of Duvent into the sharp image determining section of Olsson and Fullam et al, as their images are also stored digitally. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use derivative to determine the sharply imaged areas of an image.

10. Claims 4-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Olsson in view of Fullam et al, and further in view of Hart (U.S. Patent No. 5,473,368).

Referring to claim 4, the parameters for recording a sequence of individual recordings being predetermined by a computer and the computer controlling the sequence of the recording is not explicitly explained by Olsson or Fullam et al. However, Hart explains a microprocessor controlling the parameters of recording in the abstract and in column 9, line 48 to column 10, line 9. The parameter of recording is the output of the ultrasonic rangefinder, which detects if an intruder as entered an area. The microprocessor then controls the camera to record a scene if an intruder is detected to be in an area and the microprocessor then shuts down the surveillance device if the intruder leaves an area. By controlling the camera automatically using the range as a parameter, film or storage space and energy will be conserved, which is very important in portable or remote cameras. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have a computer control the recording of a camera depending of parameters of recording.

Referring to claim 5, the recording of the sequence of individual recordings being started automatically corresponds to claim 4. The camera starts recording automatically when an object is detected in the rangefinder area.

Referring to claim 6, the recording of the sequence of individual recordings being started by means of a photoelectric barrier corresponds to claim 4. The applicant explains the photoelectric barrier as detecting whether an object is moving towards or away from the camera. Therefore, the photoelectric barrier corresponds to the rangefinder of Hart.

11. Claims 7, 14-15, 17, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Olsson in view of Fullam et al, and further in view of well known prior art.

Referring to claim 7, the individual recordings being made at fixed, predetermined time intervals is not explicitly explained by Olsson or Fullam et al. However, a camera recording frames at fixed, predetermined time intervals is well known in the art (official notice). Every camera is capable of taking a predetermined number of images per second in order to capture a seemingly continuous event. In order to reduce the memory required to record an event, surveillance cameras typically use a lower frame rate, which resulting in poor film quality and discontinuity. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to recording images at a fixed, predetermined time interval.

Referring to claim 14, the at least one resulting image being used to identifying a feature of the finger is not explicitly explained by Olsson or Fullam et al. However, imaging a finger to identify features of a finger is well known in the art (official notice). Features of a finger serve to identify the person whose finger has been imaged. The system of Olsson and Fullam et al would be capable of imaging a finger to obtain a completely in-focus image of the finger. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to image a finger to identify features of the finger.

Referring to claim 15, the object being illuminated by a light source is not explicitly explained by Olsson or Fullam et al. However, using a light to illuminate an object being imaged in order to capture an image in the dark or obtain a higher quality image is well known in the art (official notice). Such an illumination source would allow the camera of Olsson and Fullam et al to be effective in the dark. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to illuminate an object with an illumination source.

Referring to claim 17, the object being illuminated by a plurality of light sources of different wavelength ranges and in different arrangements is not explicitly explained by Olsson or Fullam et al. However, using a plurality of different light sources at different wavelengths is well known in the art (official notice). Using different wavelengths of light allows for increased contrast in an image, which would improve object identification. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to illuminate an object with multiple light sources of different wavelengths.

Referring to claim 19, only areas of the object that are within the focus of the camera being illuminated is not explicitly explained by Olsson or Fullam et al. However, illuminating an object that is within the focus of the camera is well known in the art (official notice). Illuminating an area of an object increases the quality of that portion of the image and allows for capturing an image in the dark. Emphasizing different portions of an object would be beneficial in the imaging system of Olsson and Fullam et al as the in focus areas can be imaged in higher quality, so that the resulting composite image would be of higher quality. Furthermore, the imaging system of Olsson and Fullam et al discards the out of focus areas of the image, so

illuminating the entire scene would not improve the resulting composite image. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to illuminate only areas of an object that are within the focus of the camera.

12. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Olsson in view of Fullam et al, and further in view of Sieben (U.S. Patent No. 5,445,155).

Referring to claim 13, dividing an image plane into a plurality of areas and processing the image areas in parallel are not explicitly explained by Olsson or Fullam et al. However, Sieben explains dividing an image into plurality of areas to process the areas in parallel in column 45, lines 45-58. In order to increase the speed of the processing of images to display the images real-time, it is necessary to process the images with a powerful microprocessor or in parallel. Because the each section of the images of Olsson and Fullam et al are being determined to be sharp or not sharp, it would be obvious to send each section to an individual processor as explained by Sieben to increase processing speed at a low economical cost. Thus, multiple images, in 2D or 3D, can be computed very quickly. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to divide the image plane into a plurality of areas and process the images in parallel.

13. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Olsson in view of Fullam et al and Hart, and further in view of well known prior art.

Referring to claim 16, a pulsed light source that is synchronized with the camera being used is not explicitly explained by Olsson or Fullam et al or Hart. However, a pulsed light source being synchronized with the camera is well known in the art (official notice). The object of an illumination source is to illuminate an object for imaging in low light conditions. If a

pulsed light source were not synchronized with the camera, then the object to be imaged would not be illuminated as it is being imaged, thereby defeating the benefit of the illumination source. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to synchronize a pulsed light source with the camera being used.

14. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Olsson in view of Fullam et al and well known prior art, and further in view of Hart.

Referring to claim 18, the object being illuminated as long as it is moving towards the camera and away from the camera corresponds to claim 4. The microprocessor will operate the surveillance device as long as the output of the rangefinder detects an object is moving in an area. Hart explains in column 9, lines 54-62 that the surveillance device includes a light. Therefore, when the surveillance device is on, the light will illuminate the object being imaged. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to illuminate an object as long as it moves toward and away from the camera, so that the object can be imaged accurately in low light conditions.

Conclusion

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

> Olsson (U.S. Patent No. 6,445,415) – To exhibit capturing multiple images, determining the sharp areas of each image, and summing the sharp areas together to create a resulting sharp image as explained in the abstract.

Kaneda et al (U.S. Patent No. 5,629,735) – To exhibit an autofocusing device, which determines the position of an object within the focus detecting area as, explained in the abstract.

Adelson (U.S. Patent No. 4,661,986) – To exhibit determining a focus area of an image in order to create a single image using improved-focus pixels as explained in the abstract.

Wolbarst (U.S. Patent No. 3,699,867) – To exhibit establishing a pre-determined camera-to-subject distance by moving either the position of a subject or the camera in order to maintain a correct field of view as explained in the abstract.

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hussein Akhavannik whose telephone number is (703)306-4049. The examiner can normally be reached on M-F 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Leo H. Boudreau can be reached on (703)305-4706. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)305-3900.

Hussein Akhavannik H.A.
September 10, 2003

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